



# Great Northern

Landscape Conservation Cooperative

April 2010 – April 2011

A Year in Review

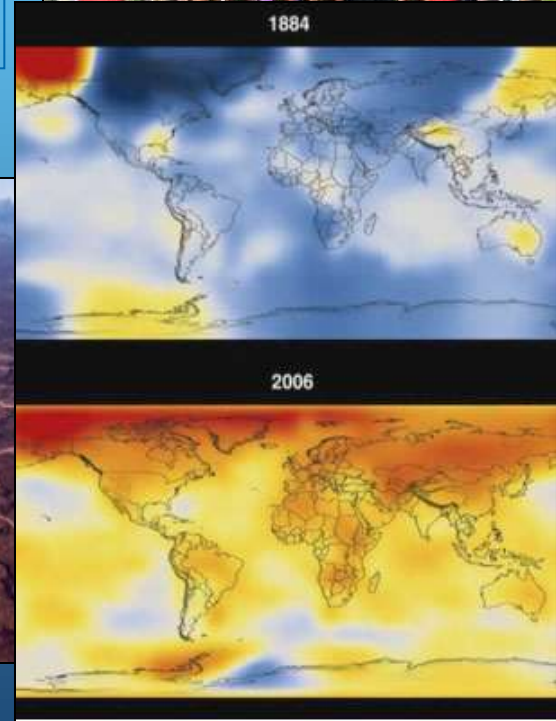


“The conservation community face unprecedented issues of scale, pace, and complexity in sustaining our Nation’s fish and wildlife resources.”



Compounded By Accelerated  
Energy Development

Year: 2042  
– Global Population ~9 Billion  
People –  
habitat fragmentation, contamination,  
pollution, invasive species, disease, threats  
to water quality and quantity...



“The conservation challenges of the 21<sup>st</sup> Century represent a force of change more far-reaching and consequential than any previously encountered.”

Also....

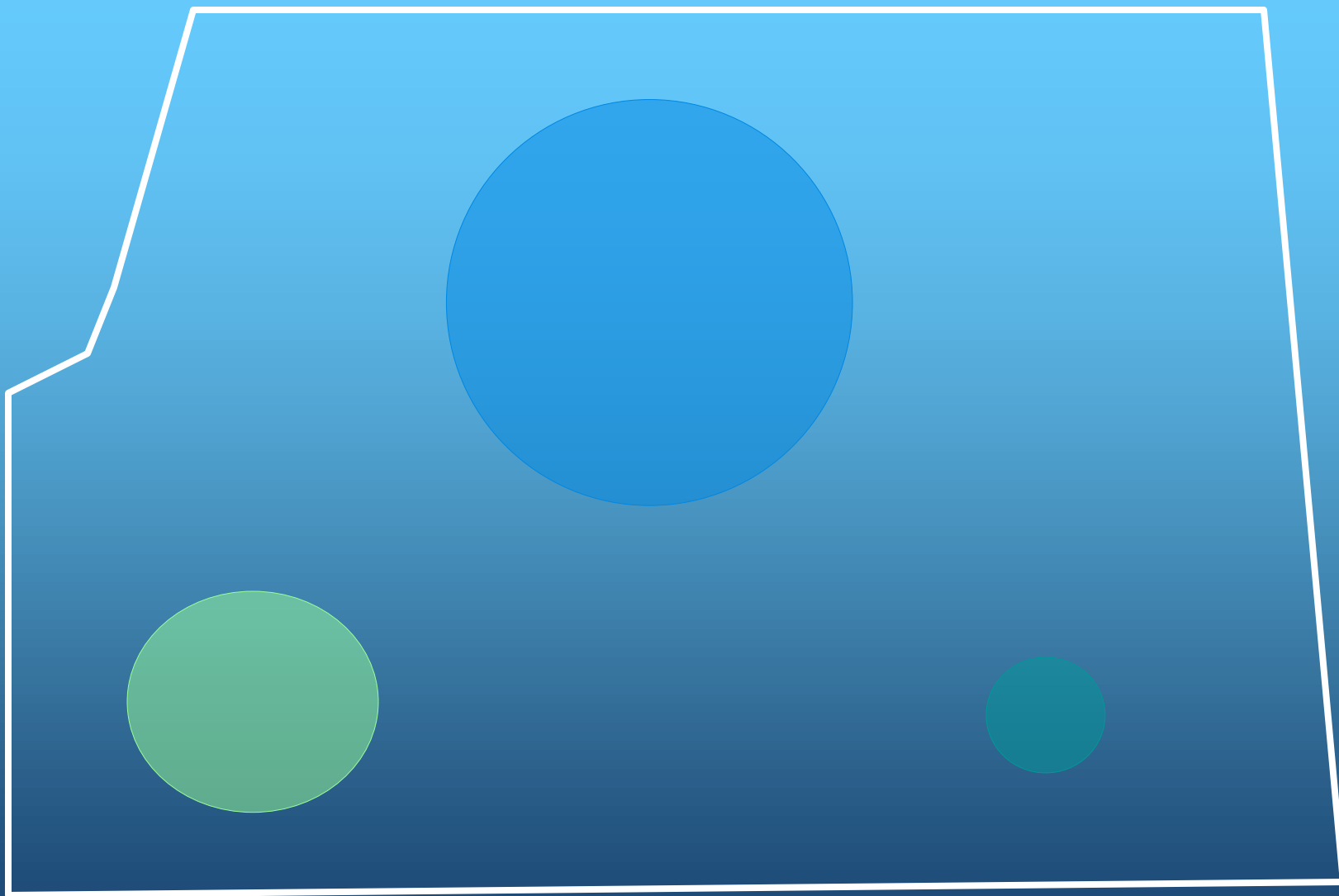
## Technological Advances

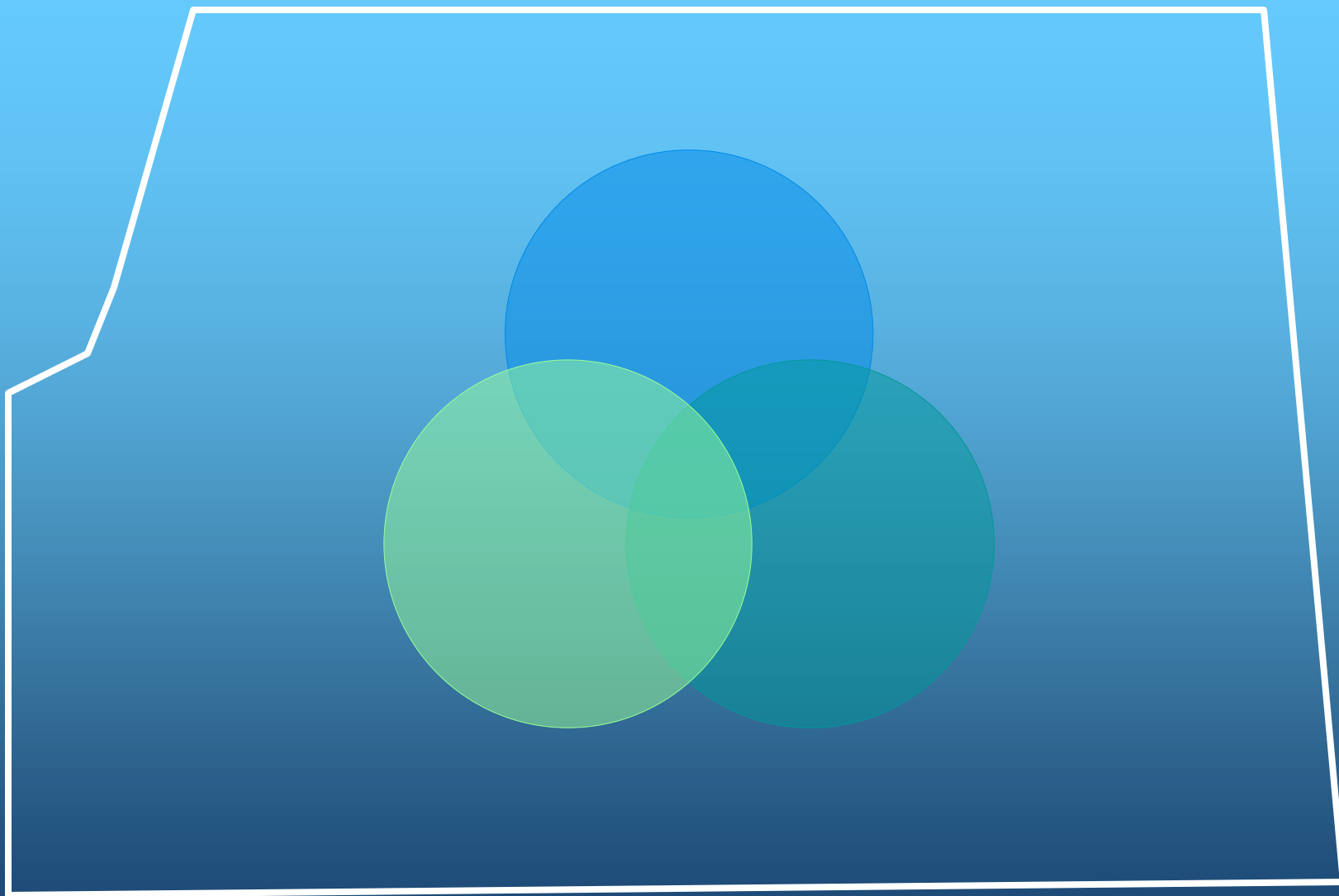
- Communications (web, cell phones)
- Computation (models)
- Transmission (data)
- Data power and resolution (satellites)

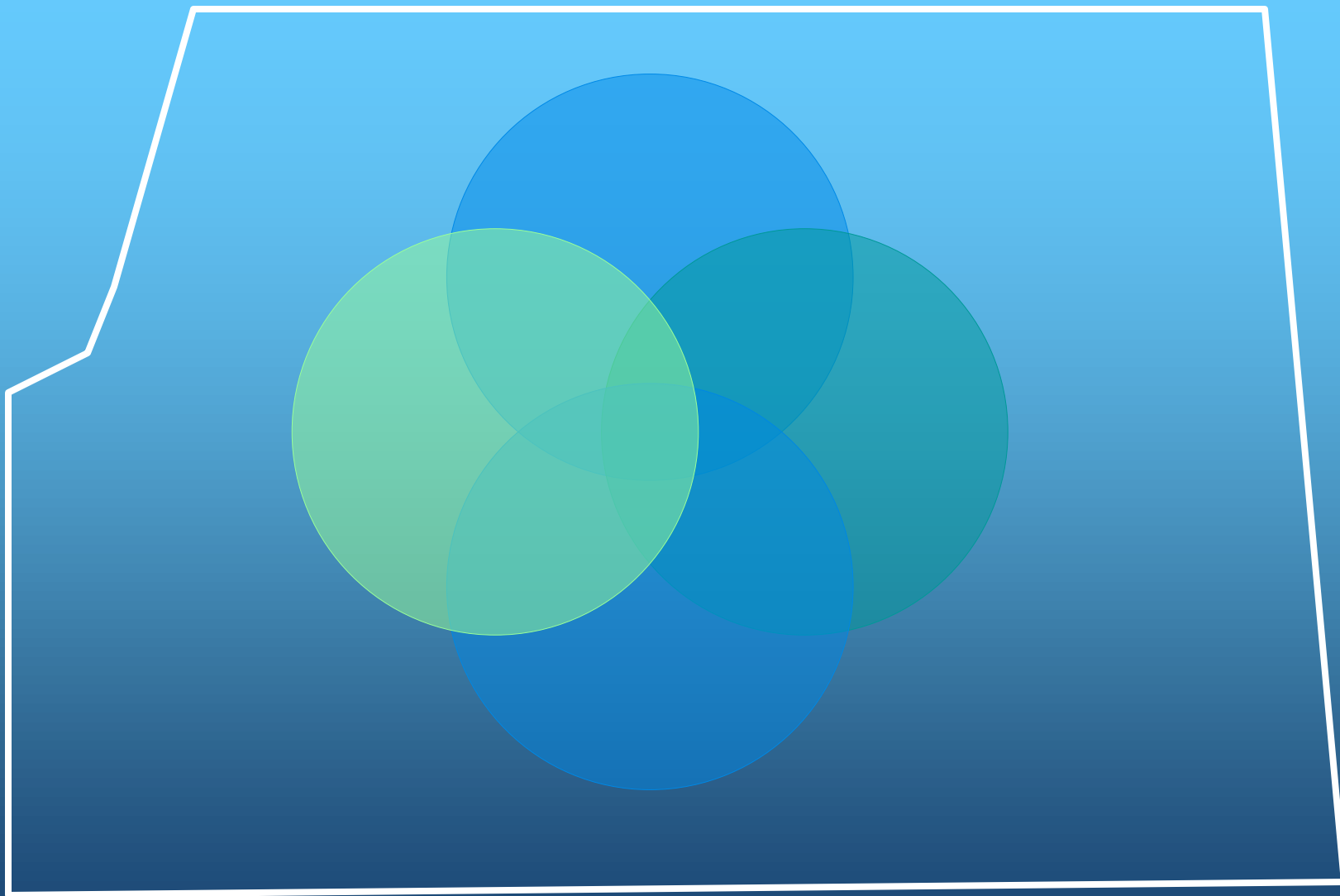
Opportunity....

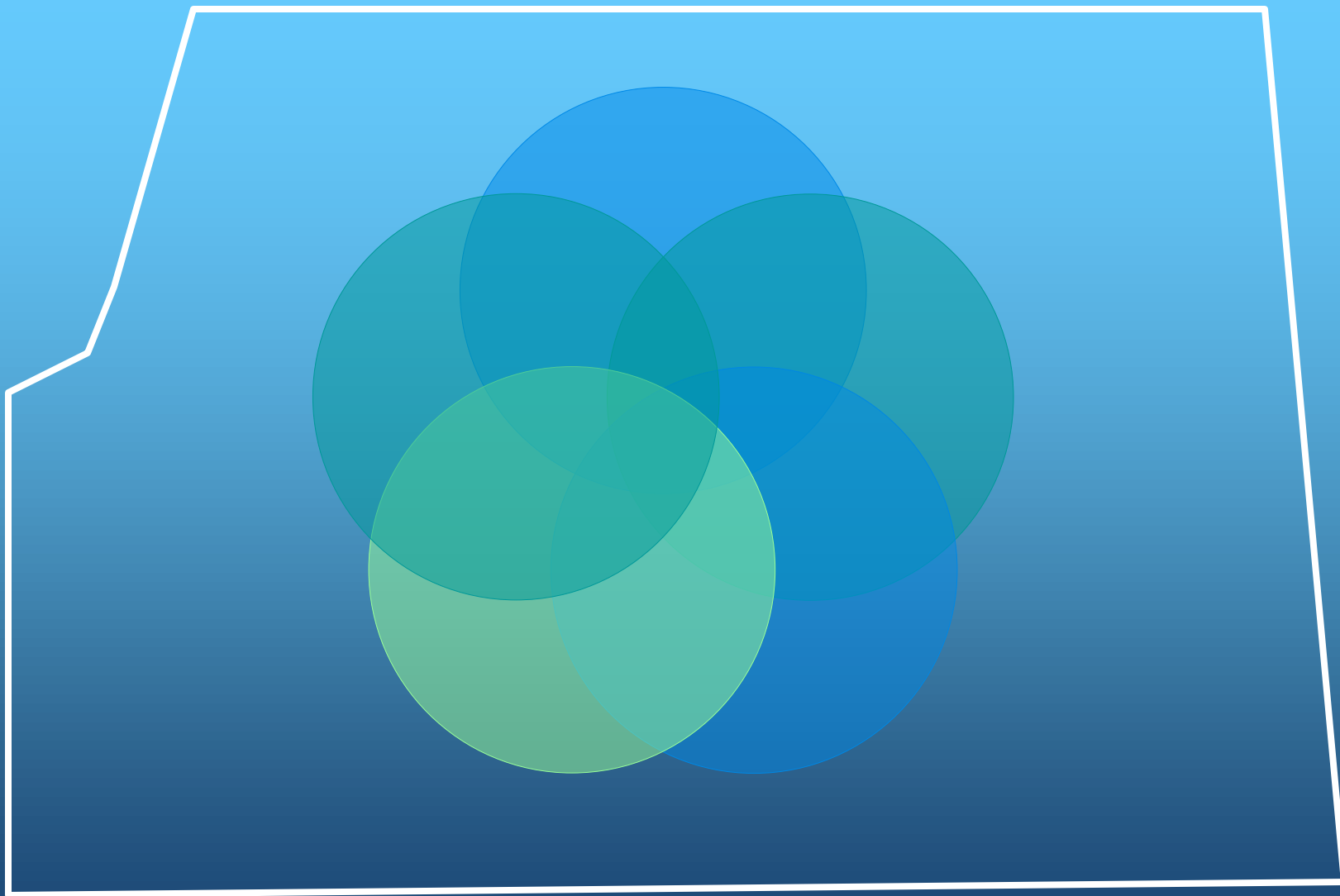
*Expectation*













The diagram consists of a white-outlined shape representing a document or folder, set against a blue gradient background. Inside the shape, there are three circles: a large blue circle at the top center, a medium green circle at the bottom left, and a small teal circle at the bottom right. The text "No longer exists" is centered below the large blue circle.

**No longer exists**





**OVERLAP**

**Geographically  
Jurisdictionally  
Operationally  
Institutionally**

**Coordination, Communication, Collaboration**

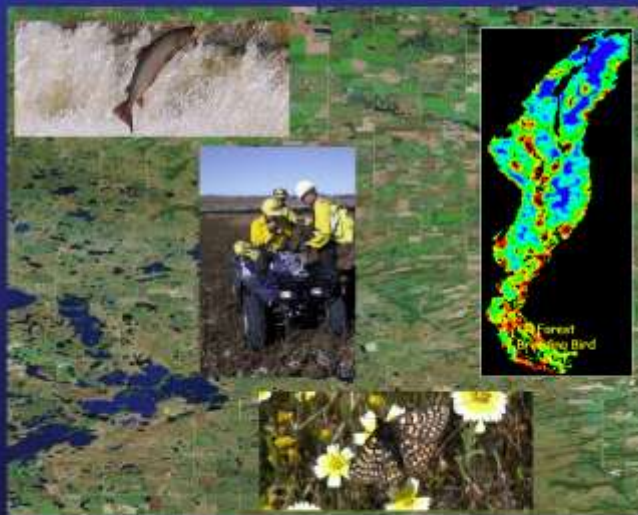


# Adaptive Management

The U.S. Department of the Interior  
Technical Guide

## Strategic Habitat Conservation

*Final Report of the  
National Ecological  
Assessment Team*



July 2006

U.S. Fish & Wildlife Service

DRAFT

# Rising to the Challenge

*Strategic Plan for Responding to  
Accelerating Climate Change*

DRAFT

U.S. Fish & Wildlife Service

## Appendix: 5-Year Action Plan

*for Implementing the  
Climate Change Strategic Plan*







# Why LCCs?

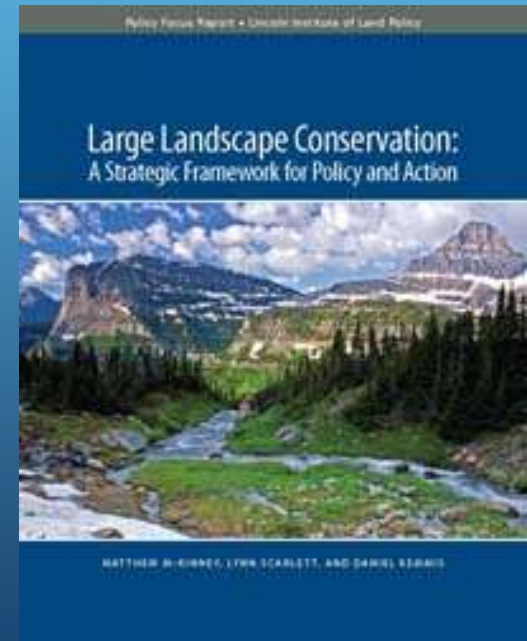
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Report - Large Landscape Conservation:  
A strategic framework for policy and action  
McKinney, Scarlett & Kemmis, 2010

*“...there is a gap in governance and a corresponding need to create informal and formal ways to work more effectively across boundaries.”*

## Barriers to Landscape Conservation

- Lack of scientific information
- Lack of capacity to organize
- Lack of a strategy to coordinate
- Fragmented financial investments



[http://www.lincolninst.edu/pubs/1808\\_Large-Landscape-Conservation](http://www.lincolninst.edu/pubs/1808_Large-Landscape-Conservation)

# Funding for Conservation Delivery (US)

from McKinney et al. 2010

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- Department of Interior (FWS, USGS, BLM, BIA, BR etc): ~\$500,000,000 for LWCF, NAWCA, NFHAP, SWG and more
- Department of Agriculture (USFS, NRCS): >\$1,000,000,000 for Farm Bill over 5 years
- Environmental Protection Agency >\$1,000,000,000 for CWA and Safe Drinking Water
- Commerce (NOAA) and others



# US Department of Interior

## Secretarial Order No. 3289



September 14, 2009:

*“A network of Landscape Conservation Cooperatives will engage DOI and federal agencies, states, tribal and local governments and the public to craft practical, landscape-level strategies for managing climate change impacts...”*

<http://www.doi.gov/whatwedo/climate/strategy>

See links to downloads: Secretarial Order 3289 and Interior's Plan

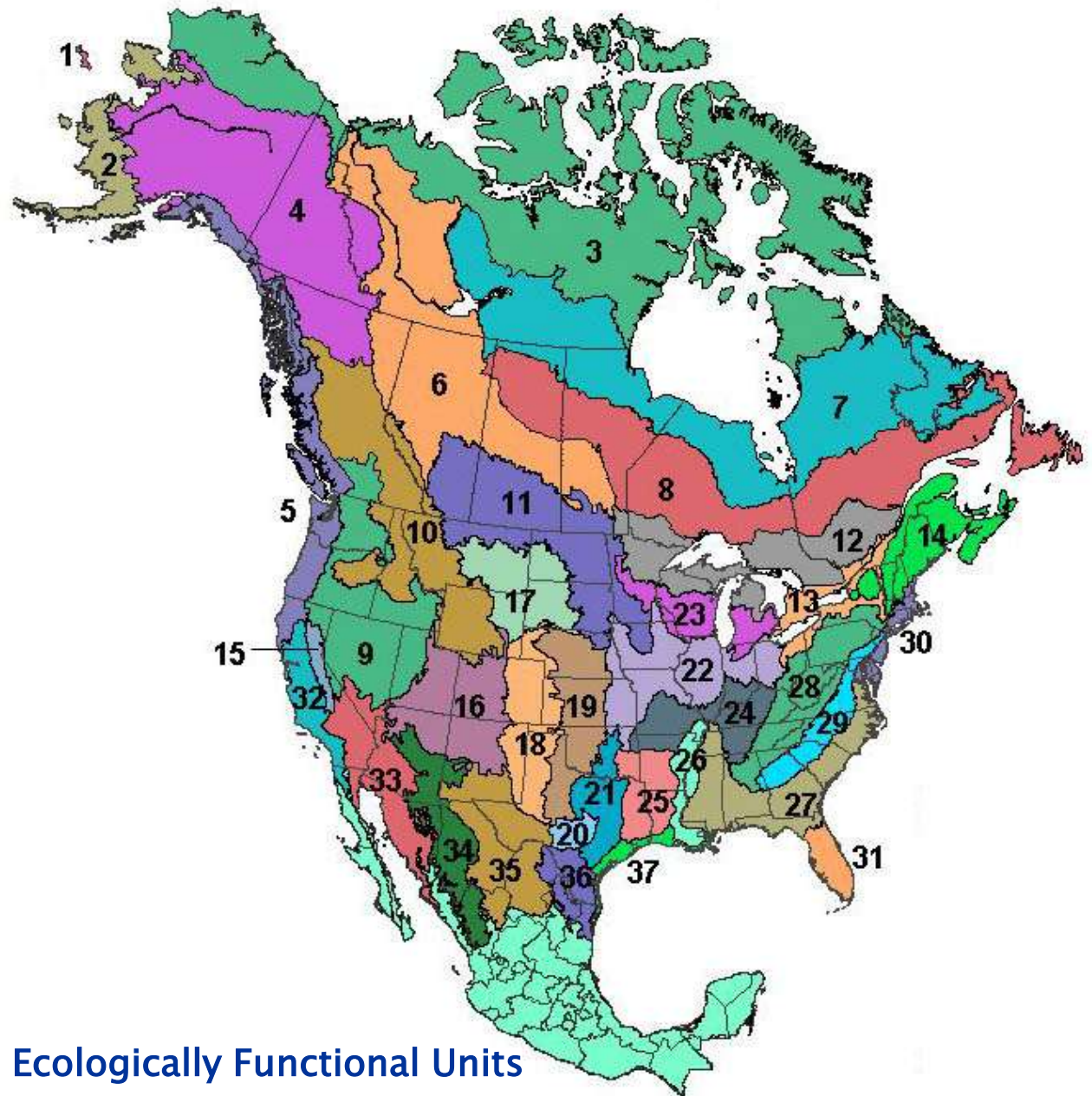


# A Continental Approach:

Bailey's  
Ecoregions

Bird Conservation  
Regions

River Basins

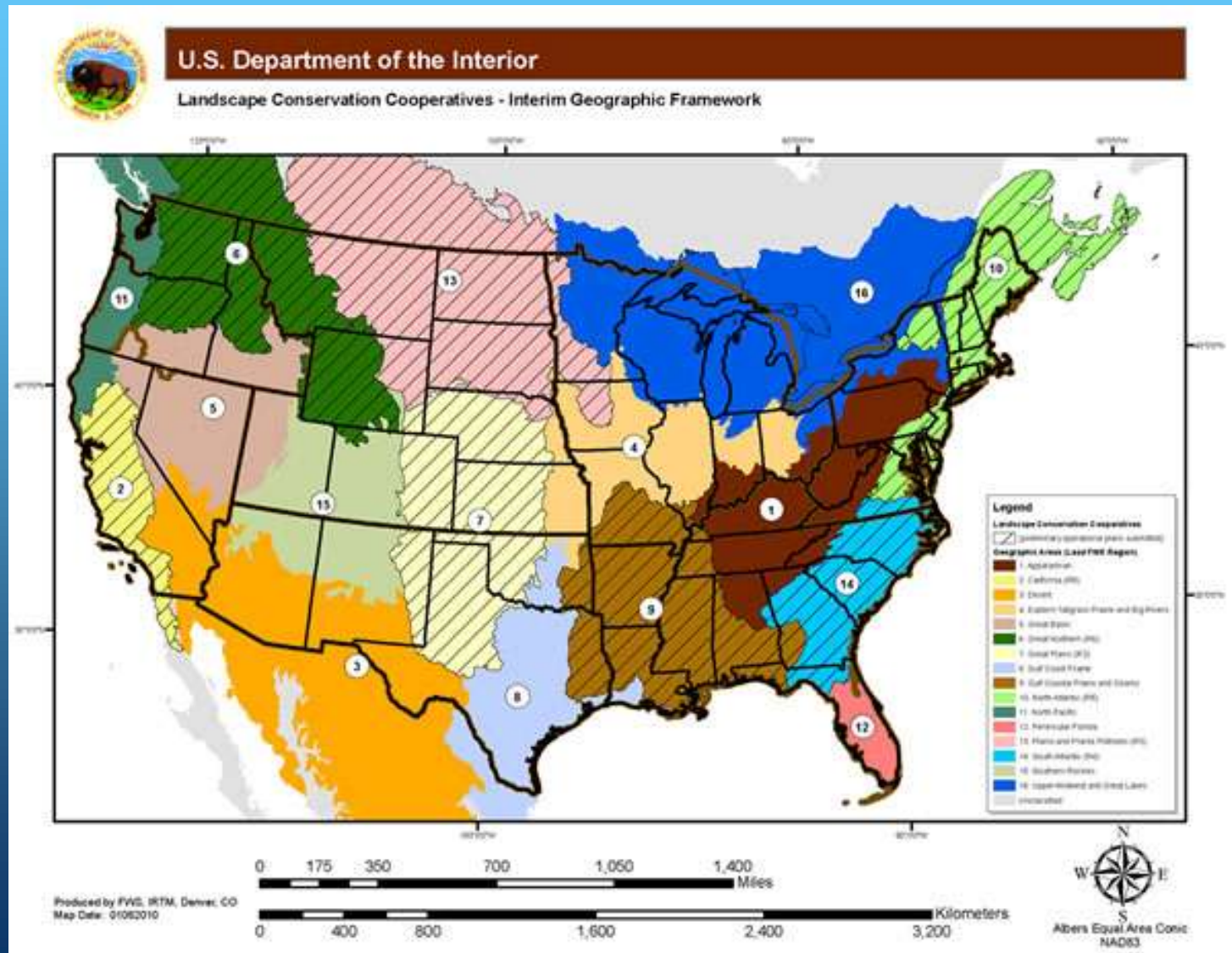


Ecologically Functional Units



# LCC Geographic Framework

## August 2009







## USA

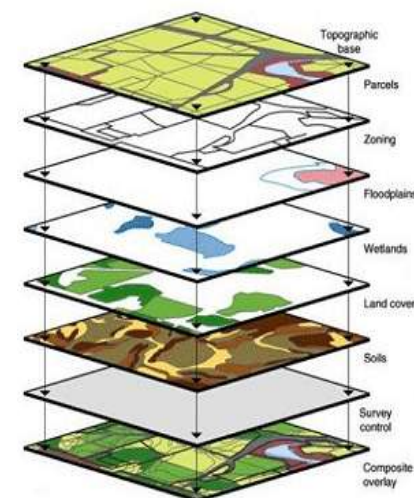
- Montana
- Wyoming
- Idaho
- Washington
- Oregon

## CANADA

- British Columbia
- Alberta

## FY10 Science Assessment Results

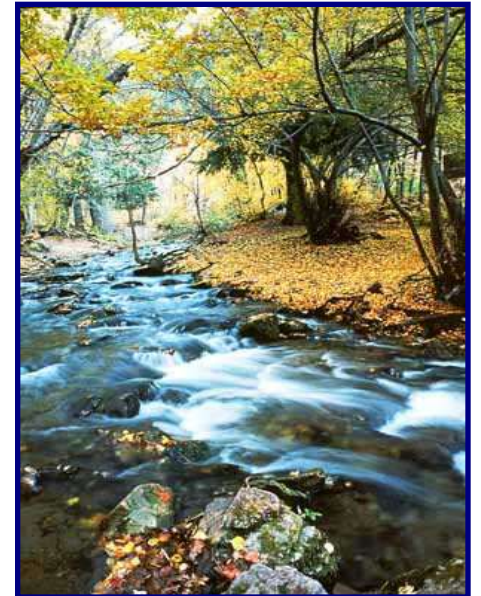
- Climate information (current and projected)
- Land Cover (e.g., Landfire, NLCD)
- **Data mgmt/interfacing capabilities and tools**
- **Habitat Connectivity**
- **Vulnerability assessments – Water Resources**
- Biological/Species monitoring/evaluation



## Goal Statement – April 2010

Coordinate, facilitate, promote, and add value to large landscape conservation to build resource resilience in the face of climate change and other landscape-level stressors through:

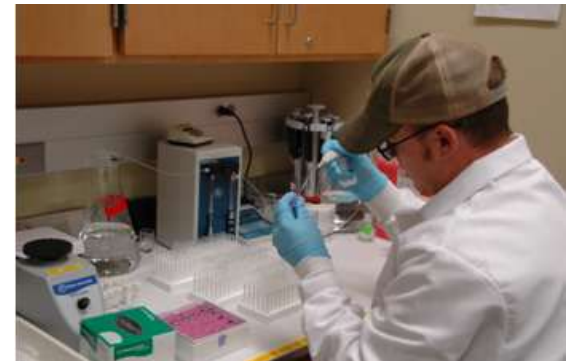
- **SCIENCE SUPPORT**
- **COORDINATION**
- **INFORMING CONSERVATION ACTION**
- **MONITORING AND EVALUATION**
- **OUTREACH AND EDUCATION**



## SCIENCE SUPPORT

- Identify and facilitate the development, integration, and application of scientific information needed to inform water, land, and species management decisions in the face of climate changes and other landscape stressors

**COORDINATION**  
**INFORMING CONSERVATION ACTION**  
**MONITORING AND EVALUATION**  
**OUTREACH AND EDUCATION**



## Science Support

## COORDINATION

Support coordination and integration of conservation science and actions across ecosystems at the landscape scale, leveraging the capabilities of respective agencies/organizations/ partnerships, and provide real-time situational awareness of on-going conservation efforts

**INFORMING CONSERVATION ACTION**  
**MONITORING AND EVALUATION**  
**OUTREACH AND EDUCATION**





## Science Support Coordination

### INFORMING CONSERVATION ACTION

- Promote conservation actions at the unit and ecosystem level by providing decision support tools and informing conservation action that support resource resilience

### MONITORING AND EVALUATION OUTREACH AND EDUCATION

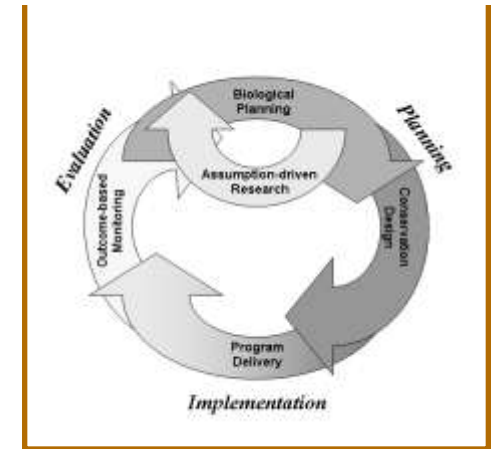


## Science Support Conservation Action Coordination

## MONITORING AND EVALUATION

Monitor landscape scale indicators, test scientific assumptions, and evaluate effectiveness of conservation actions to inform adaptive management decision making.

## OUTREACH AND EDUCATION



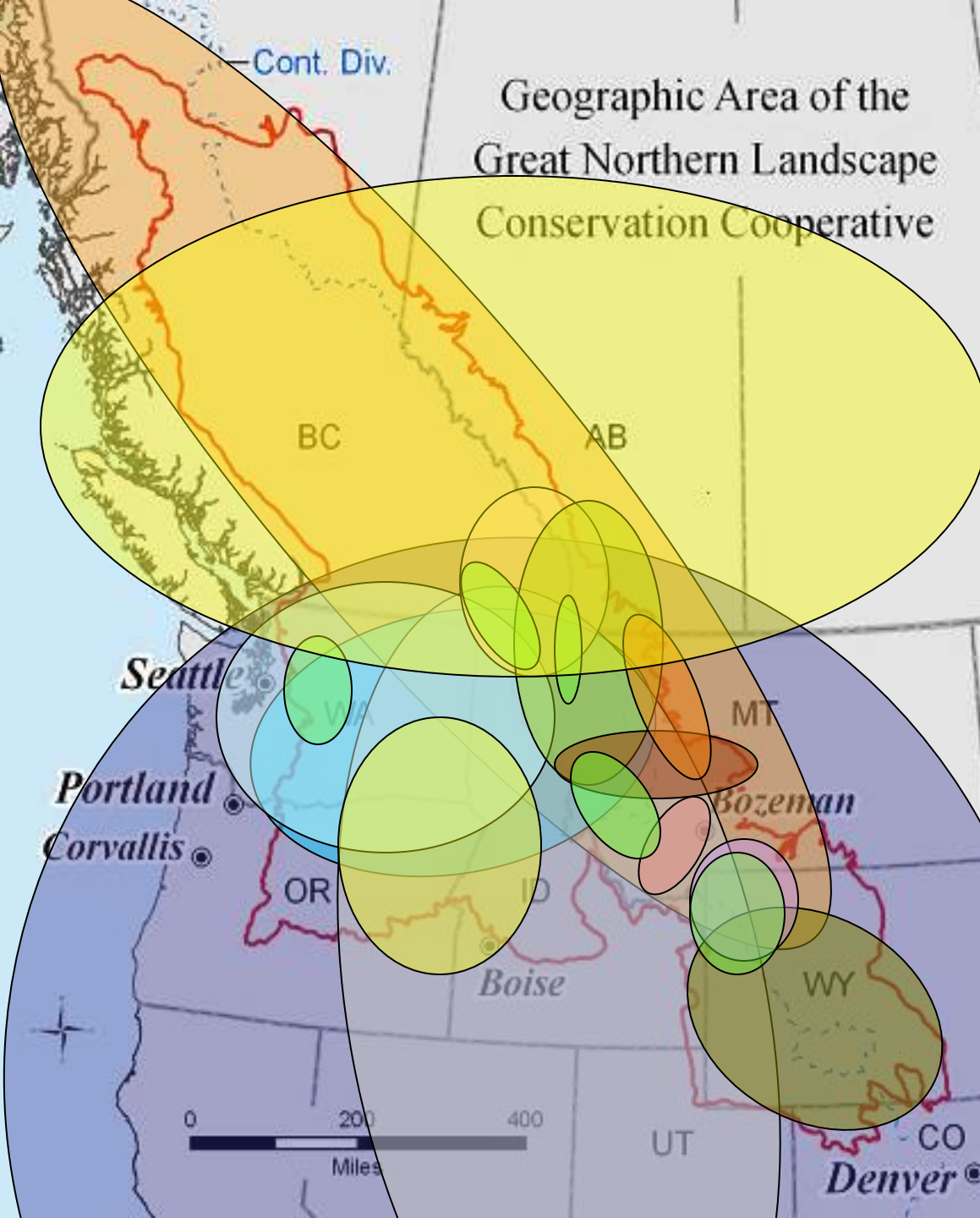


**SCIENCE SUPPORT  
COORDINATION  
INFORMING CONSERVATION ACTION  
MONITORING AND EVALUATION**

## **OUTREACH AND EDUCATION**

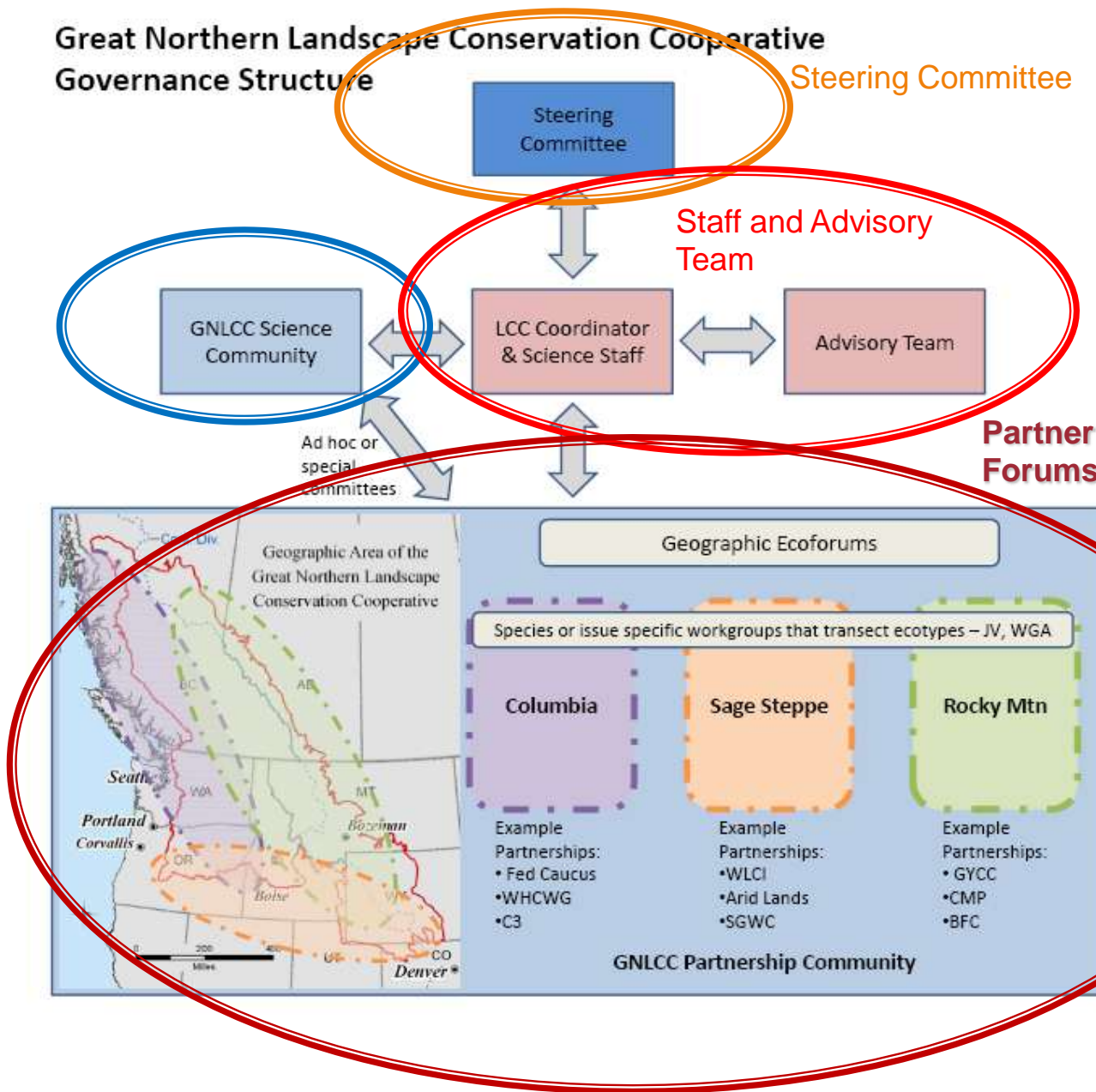
Communicate relevant science information and GNLCC activities and opportunities to partners and users. Advocate for collaborative conservation and seek to leverage capabilities and support.





**Greater Yellowstone Coord Comm**  
**Wyoming Landscape Conservation Initiative**  
**Arid Lands Initiative**  
**Kootenay Conservation Program**  
**Blackfoot Challenge**  
**Rocky Mountain Front**  
**Big Hole Conservation Alliance**  
**Crown of the Continent**  
**Interagency Grizzly Bear Comm**  
**Washington Connected Lands**  
**Columbia Basin Fed Caucus**  
**Intermountain West JV**  
**Yellowstone to Yukon**  
**Western Governors**  
**CAN Wildlife Directors Council**  
**And others....**

# Great Northern Landscape Conservation Cooperative Governance Structure



## FUNCTIONS

### Steering Committee or Executive Council

1. Set vision, Goals and Priorities for GNLCC
2. Provide direction to the GNLCC Coordinator and Staff
3. Approve Long-term Strategy and Operations
4. Approve GNLCC capacity needs
5. Approve funding for annual workplan including priority setting process

### GNLCC Coordinator and Staff/Advisory Team

1. Promote and communicate long-term vision
2. Develop and write long-term strategy and annual workplans
3. Coordinate science and information needs
4. Develop and implement process for operations
5. Develop annual workplan recommendations
6. Develop and revise Long-term Strategy
7. Coordinate, communicate and provide outreach to Science and Partnership Communities

# LCC Flagship Conservation Priorities

## SWAP Analysis August 2010

TOTAL SPECIES = 27	Washington	Oregon	Idaho	Montana	Wyoming	GNLCC	Adv. Team	IWJV
American bald eagle	Yes	Yes	Yes	Yes	Yes			
American white pelican	Yes	Yes	Yes	Yes	Yes			
arctic grayling				Yes	Yes	Yes		
bighorn sheep							Yes	
bull trout	Yes	Yes	Yes	Yes	Yes	Yes		
burrowing owl	Yes	Yes	Yes	Yes	Yes	Yes		
Columbia spotted frog	Yes	Yes	Yes		Yes	Yes		
cutthroat trout ( <i>Oncorhynchus clarkii</i> )	Yes	Yes	Yes	Yes	Yes			
ferruginous hawk	Yes	Yes	Yes	Yes	Yes			
fisher	Yes	Yes	Yes	Yes	Yes			
greater sage grouse	Yes	Yes	Yes	Yes	Yes	Yes		
grizzly bear	Yes		Yes	Yes	yes	Yes		
lesser scaup								Yes
Lewis' woodpecker	Yes	Yes	Yes	Yes	Yes	Yes		
mallard								Yes
mule deer							Yes	
northern leopard frog	Yes	Yes	Yes	Yes	Yes			
northern pintail								Yes
Pacific lamprey	Yes	Yes	Yes			Yes		
peregrine falcon	Yes	Yes	Yes	Yes	Yes			
pygmy rabbit	Yes	Yes	Yes	Yes	Yes			
salmon/steelhead ( <i>Oncorhynchus</i> spp.)						Yes		
sandhill crane								Yes
sharp-tailed grouse							Yes	
trumpeter swan	Yes		Yes	Yes	Yes	Yes		
willow flycatcher		Yes			Yes	Yes		
wolverine	Yes		Yes	Yes	Yes	Yes		
Totals	17	15	17	16	18	12	3	4

# Great Northern-Conservation Priorities Landscape Initiative Analysis

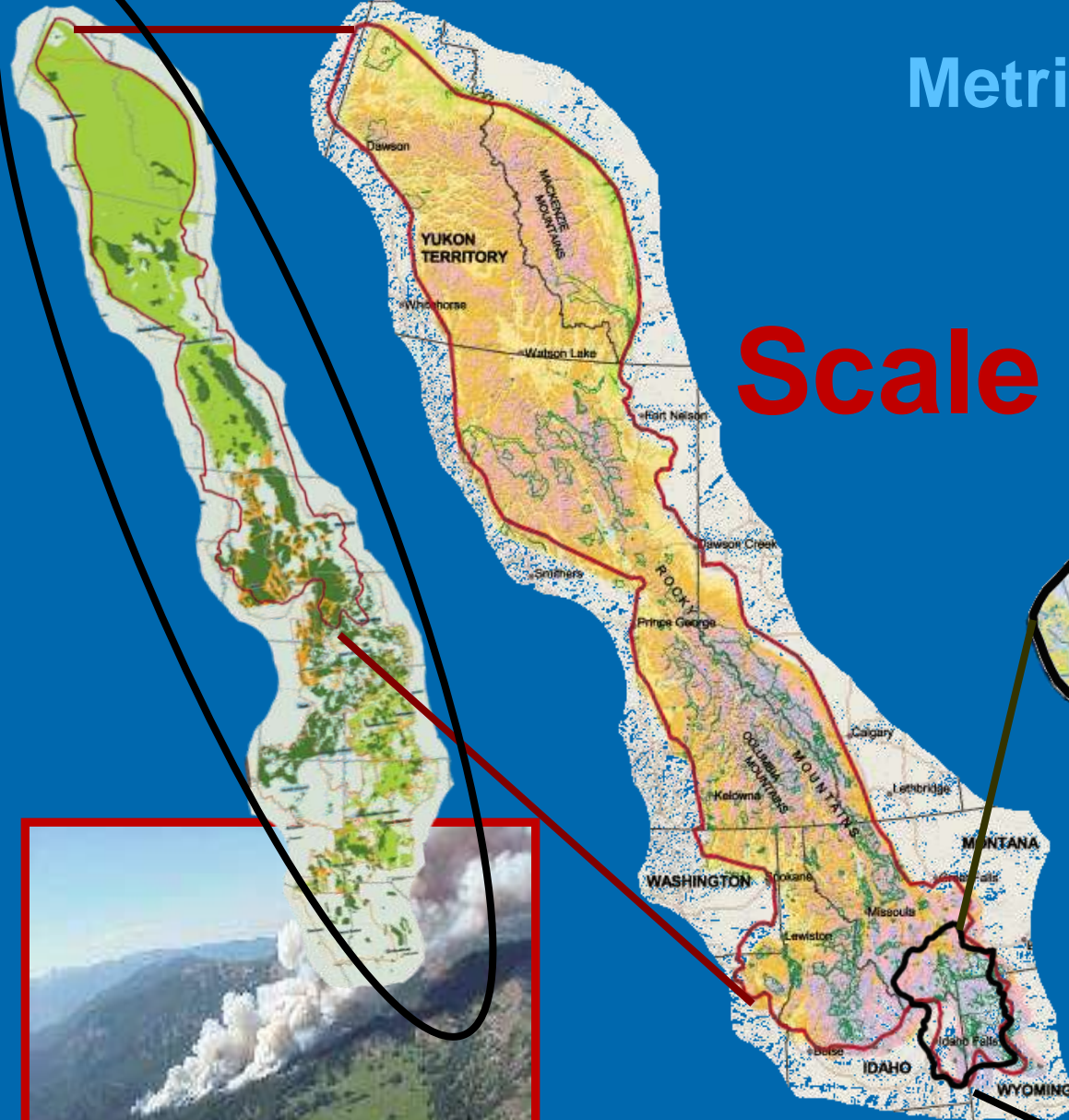
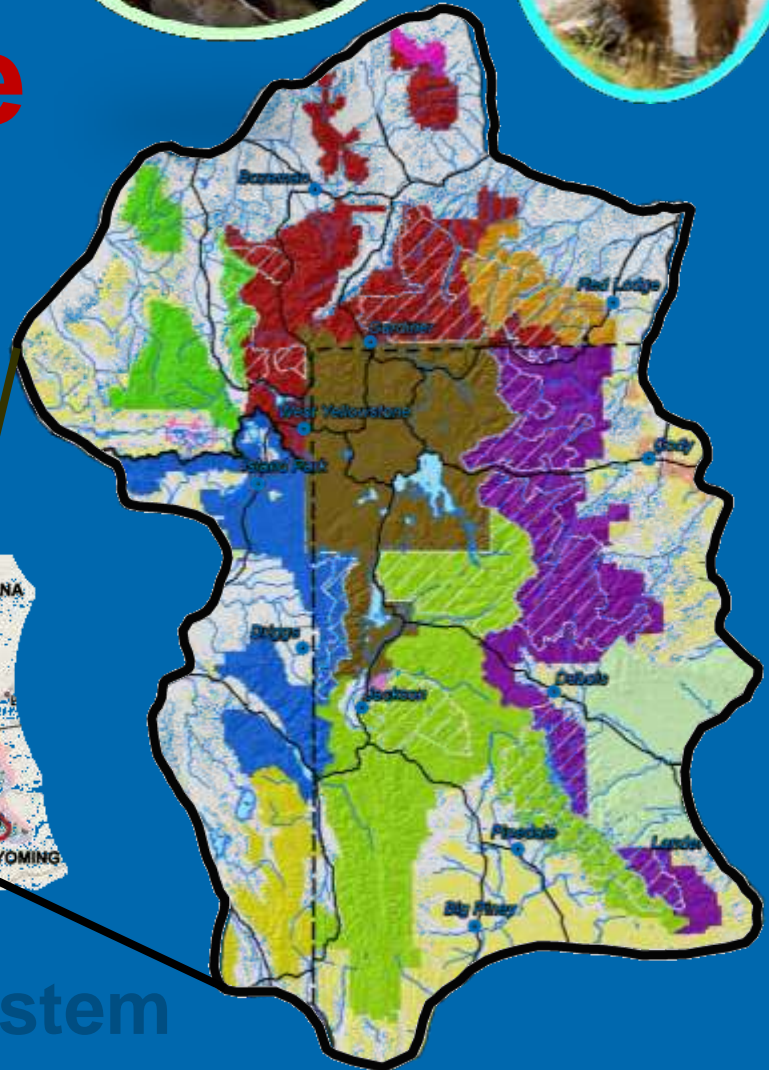
GNLCC State	Initiatives	SVAP	and Initiatives For Each State	7 GNLCC Priority Species	Initiatives	Common to SVAPs	Processes	Common to Initiatives
Montana	12	1	13	Grizzly bear	4	4	Wildland Fire	3
Idaho	11	1	12	Bull Trout	4	4	Insects	1
Washington	9	1	10	Steelhead	3	1	Disease	1
Oregon	8	1	9	Salmon	3	2	Disruption of historic disturbance	1
Wyoming	8	1	9	Wolverine	3	4	Phenology	1
				Arctic Grayling	2	2	Hydrologic	1
				Greater Sage Grouse	2	5		
<b>Ecosystems</b>	<b>Common to</b>	<b>Common to</b>		<b>16 Non GNLCC Priority Species</b>			<b>Landscape Issues</b>	<b>Common to Initiatives</b>
Shrub-steppe	8	5		Westslope Cutthroat Trout	4	5	Connectivity	8
Aspen	4	5		Yellowstone Cutthroat Trout	4	3	Invasives	7
Mixed conifer forests	3	4		Canada lynx	3	4	Climate change	5
Grasslands	2	5		Whitebark pine	2	0	Water Quantity	3
Aquatic	2	3		5-needle pines	2	0	Landscape Use	2
Alpine	2	0		Pygmy rabbit	1	5	Rural Subdivisions	1
Mixed conifer woodlands	1	5		Redband Trout	1	4	Energy development	1
Wetland	1	4		Sharp tail grouse	1	4	Development	1
Subalpine	1	1		Pine marten	1	3	Water Quality	1
Mixed grass prairie	1	1		Bighorn sheep	1	2	Air Quality	1
Agricultural	1	1		Kootenai River White Sturgeon	1	2	Ecosystem Health	1
High elevation lakes	1	0		Elk	1	1	Toxic substances	1
High Desert	1	0		Pronghorn	1	1		
				pika	1	1		
				Colorado River Cutthroat Trout	1	1		



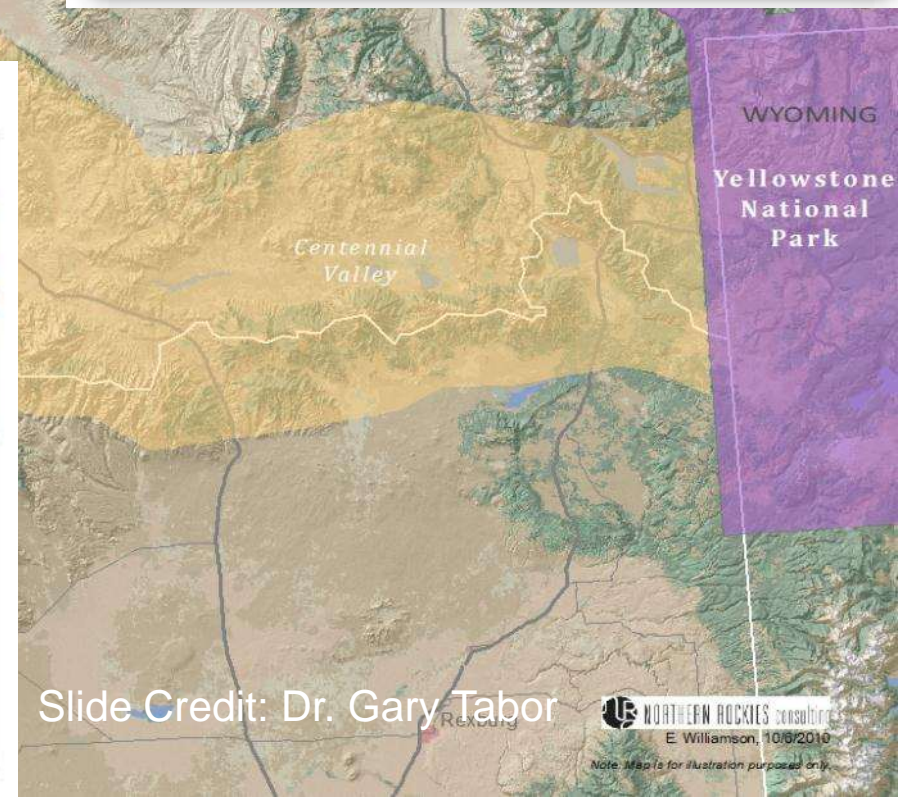
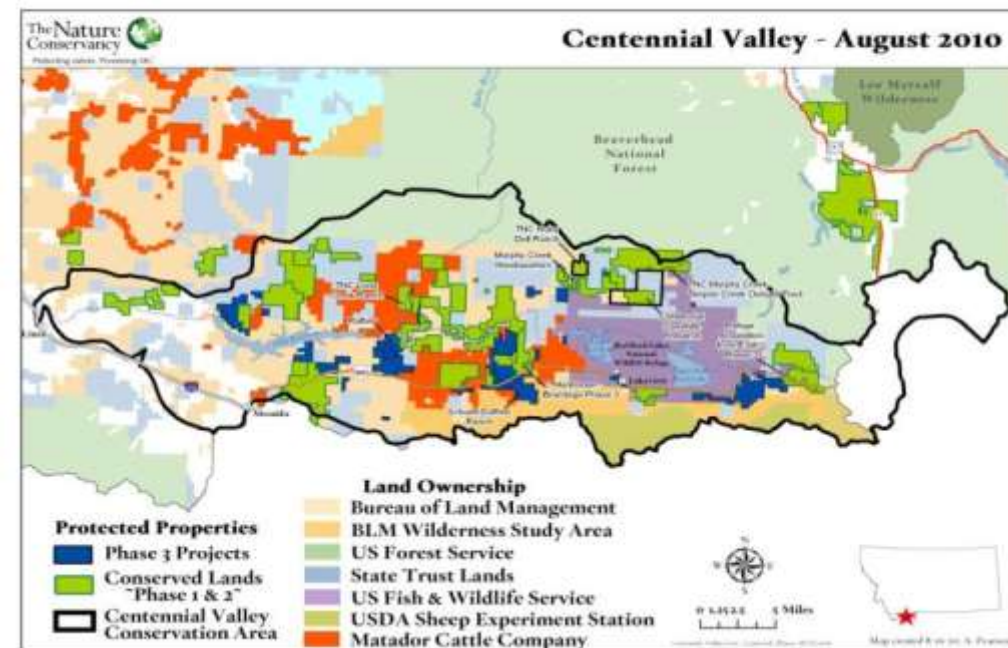
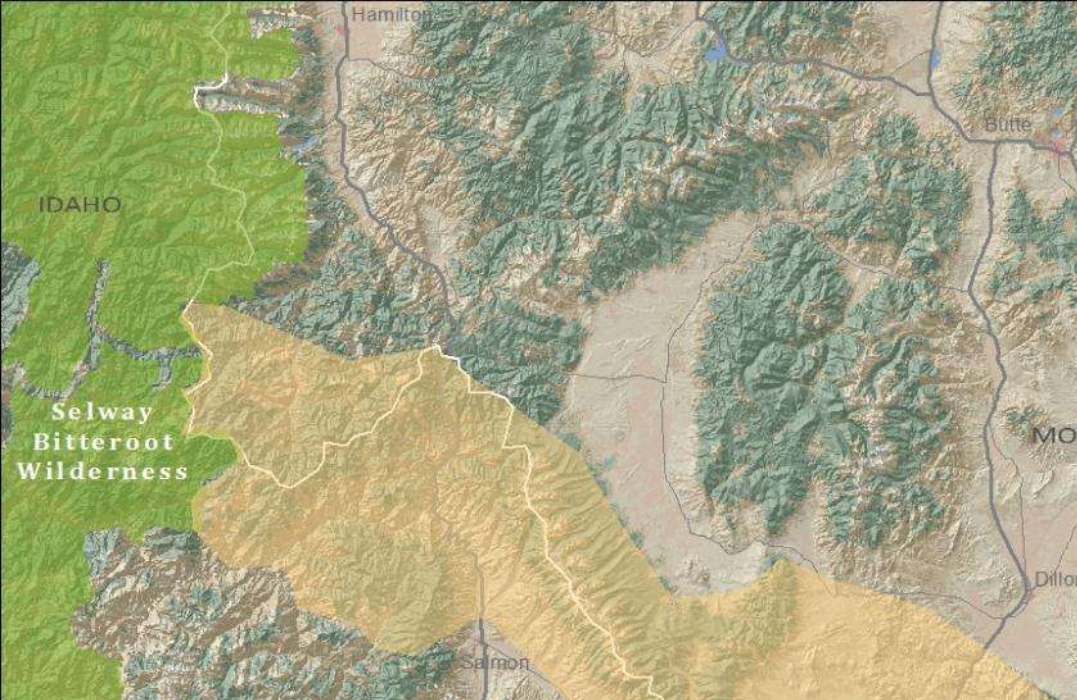
Metric @ Species

Scale

Process @ System





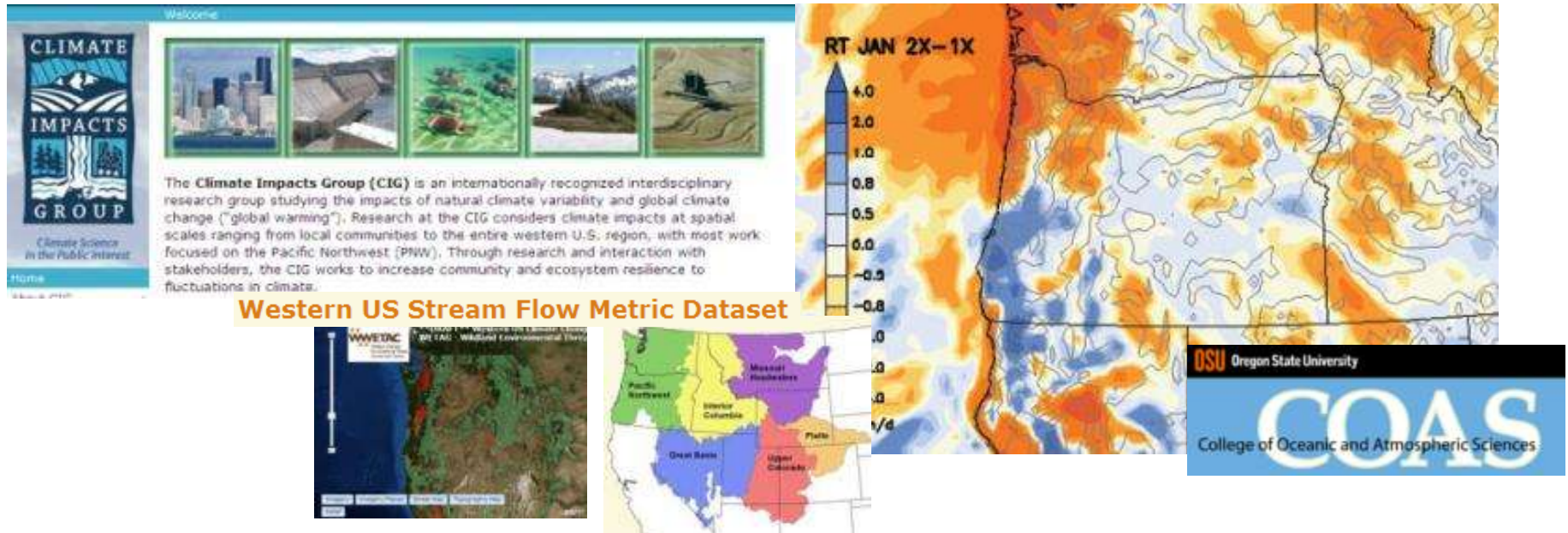


Slide Credit: Dr. Gary Tabor



# Relevant Science

## Downscaled Climate Models



- Statistically downscaled models by CIG funded by USFS/FWS
- Dynamically downscaled RCM by USGS (S. Hostetler)
- Covers 5 states or more (WA, OR, ID, MT, WY)
- Housed and served by USGS/GNLCC
- Next:
  - Develop user interface and training
  - Ecologically relevant variables e.g., WWETAC, I&M Phenology, Streamflow

# Examples of Transboundary Science

## supported by Great Northern LCC

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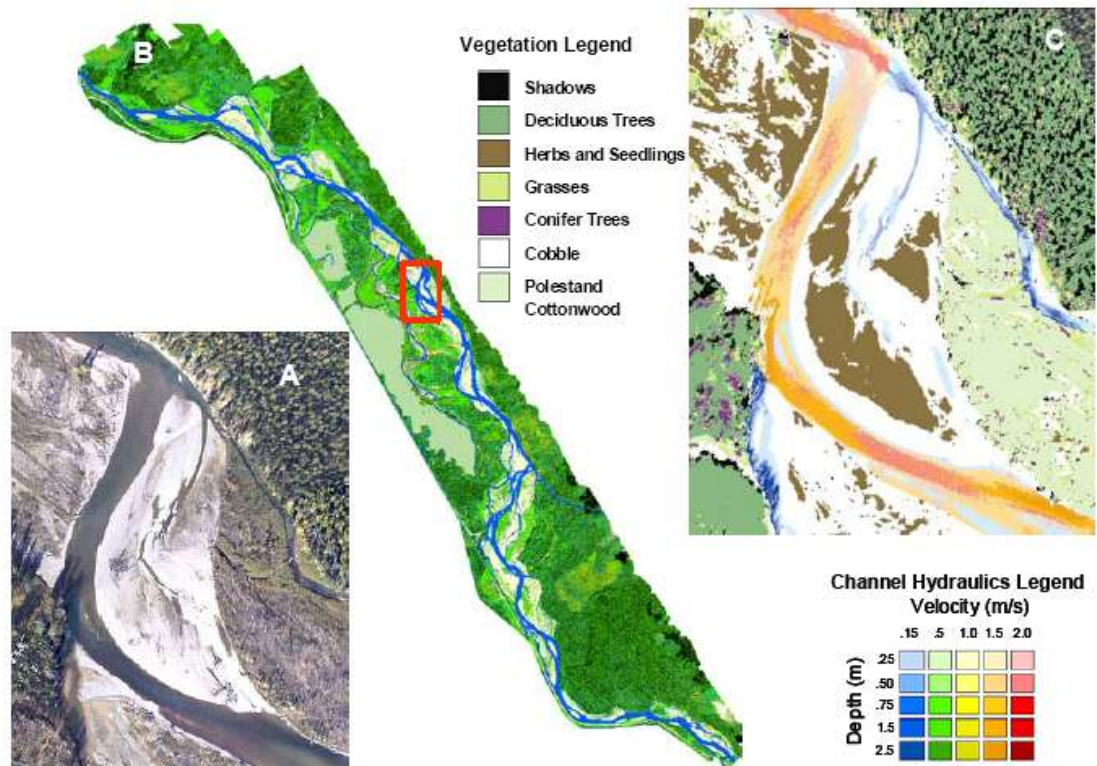
- FY10 Crown Managers Partnership Ecosystem Baseline Assessment
  - \$50K to University of Calgary via partnership
- FY10 Large Carnivore Fine-scale Linkages
  - \$150K to University of Montana via IGBC and partnership
- FY10 North Fork of Flathead Watershed Vulnerability Pilot
  - \$140K to USGS, FWS, Flathead Biological Station of UM partnership
- FY10 Washington Connected Landscapes Project
  - \$364K to State of WA, TNC, U of WA, and partners
- **FY11: Recommendation will be finalized by June 1, 2011**
  - Canadian Intermountain Joint Venture project
  - Okanagan-Similkameen British Columbia Biodiversity Strategy



# Predicting Effects of Climate Change on Aquatic Ecosystems in the GNLCC (North Fork Flathead Pilot)

Combining Vulnerability Assessments, Landscape Genomics, and Modeling for Conservation

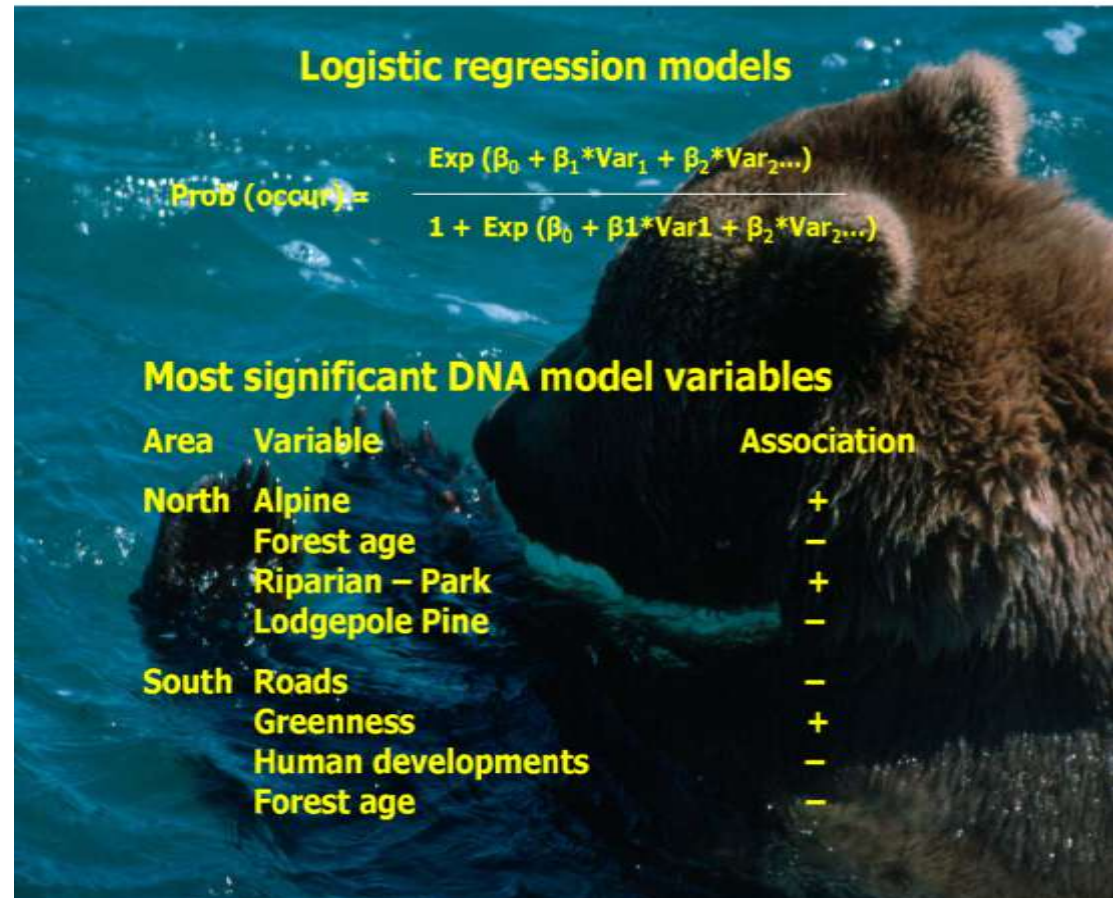
- Remote sensing
- Habitat classification
- Climate analysis
- Species validation



# Northern Rockies Fine-scale Linkages

## Grizzly Bear Example

- Corridor analysis
- Ecological modeling
- Species validation





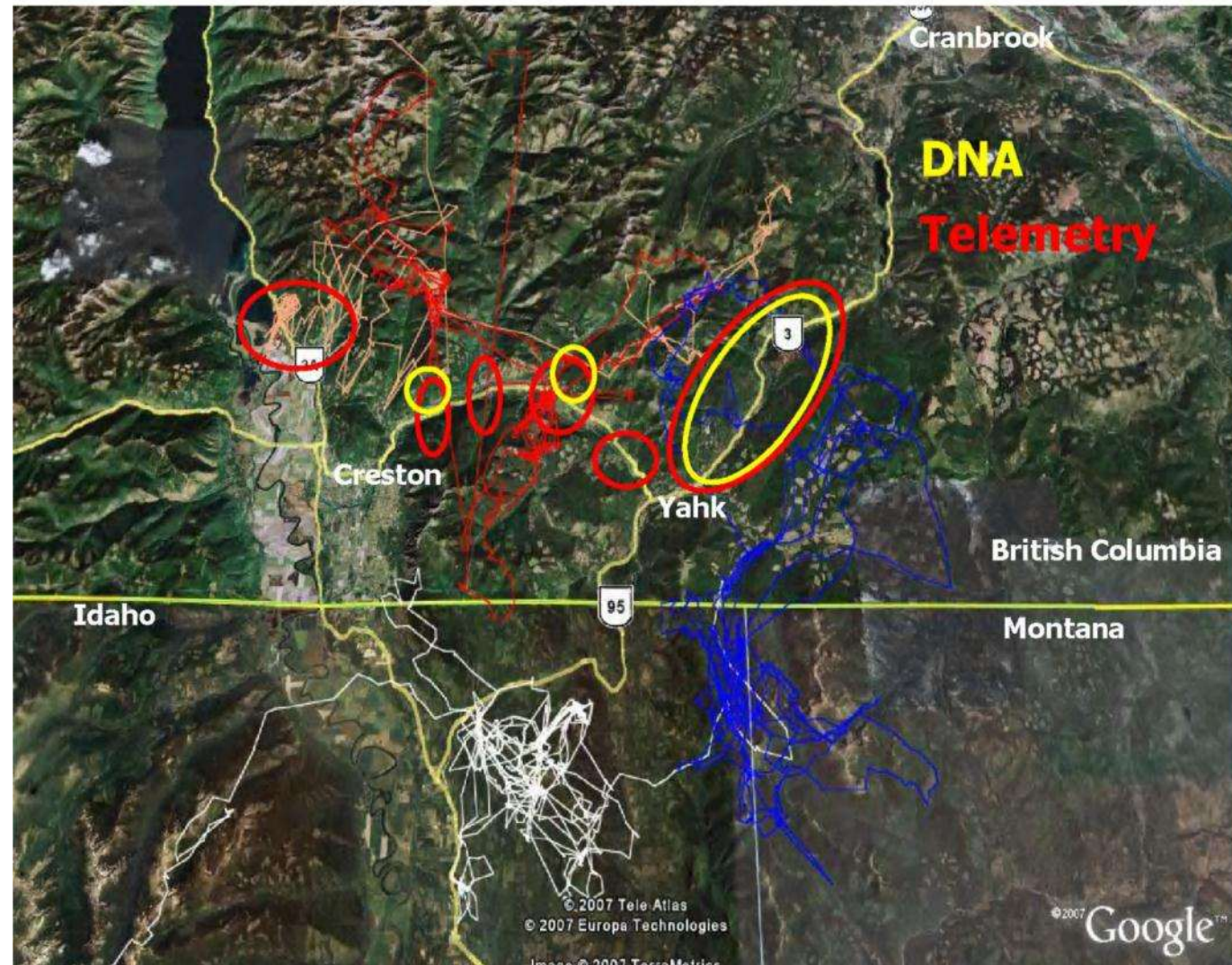
# Northern Rockies Fine-scale Linkages

## Grizzly Bear Example

- Spatial data
- Movement
- DNA info



Servheen et al. 2010

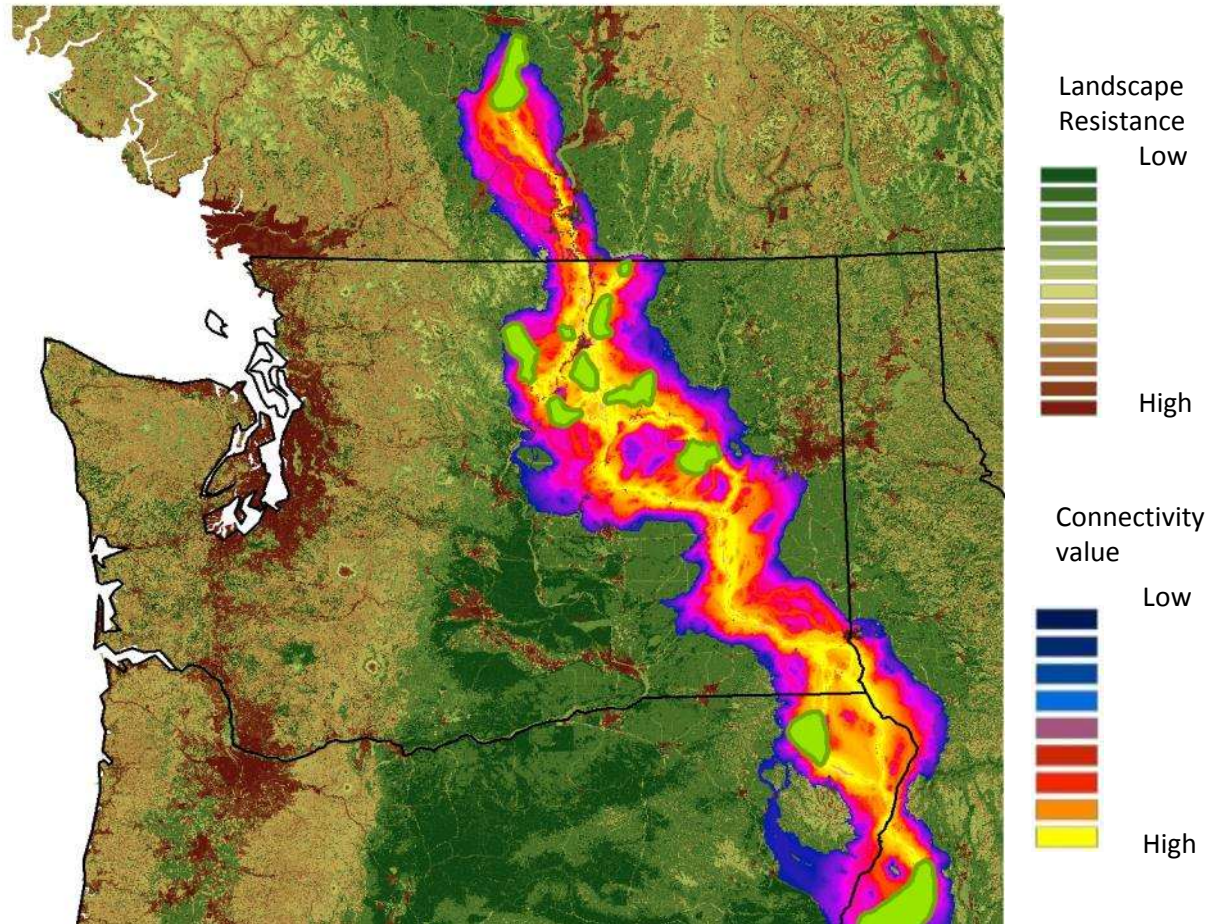




# Washington Habitat Connectivity Analyses

## Columbian Sharp-tailed Grouse Example

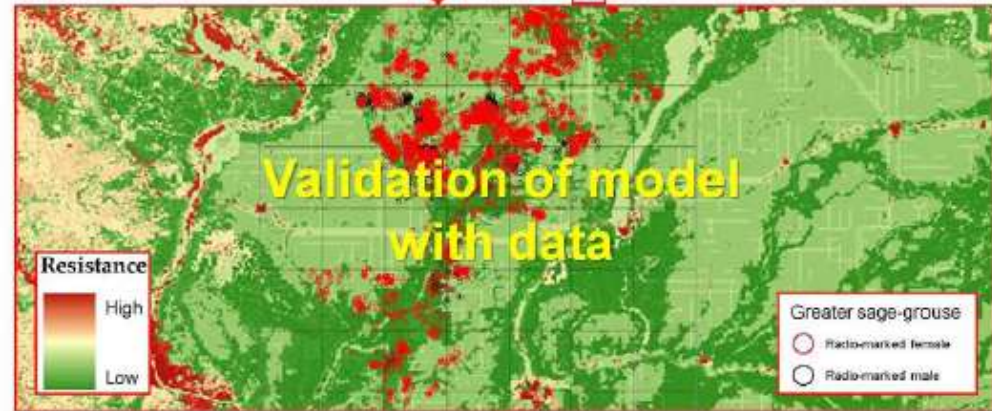
- Corridor analysis
- Species core areas
- Species DNA



# Science to Management

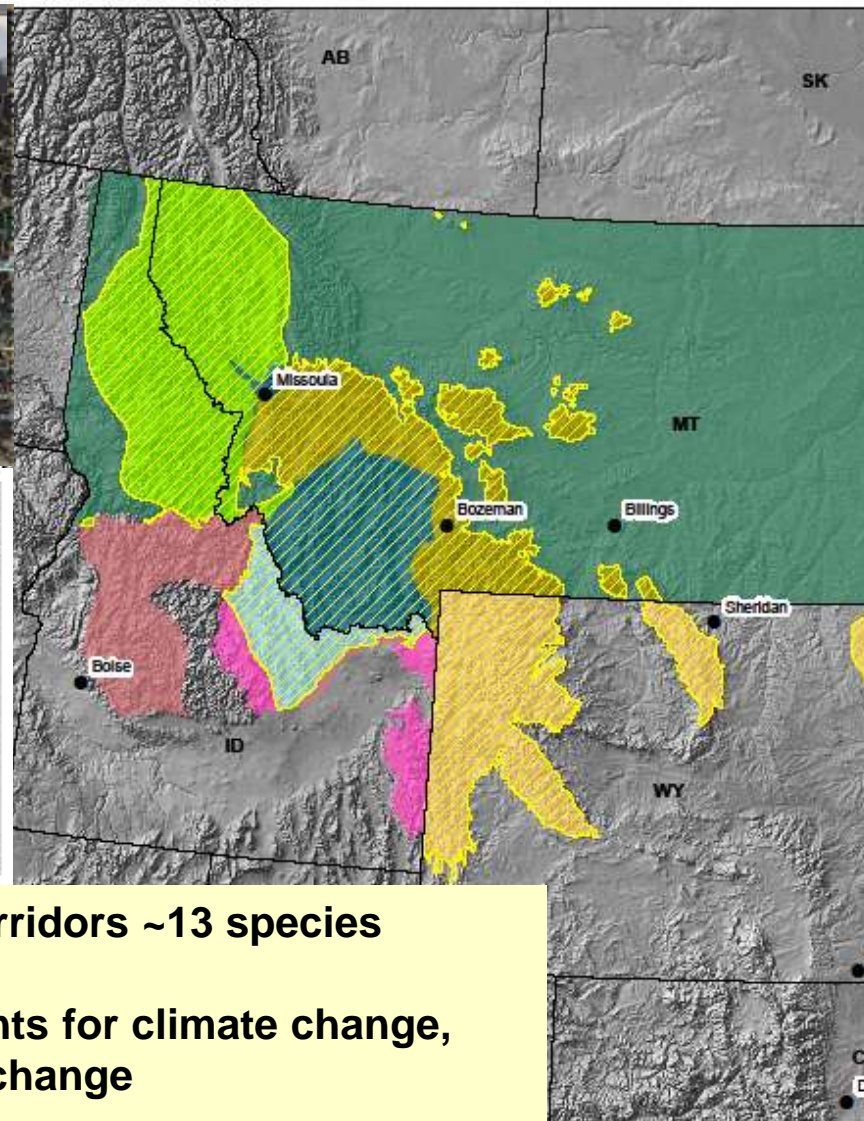
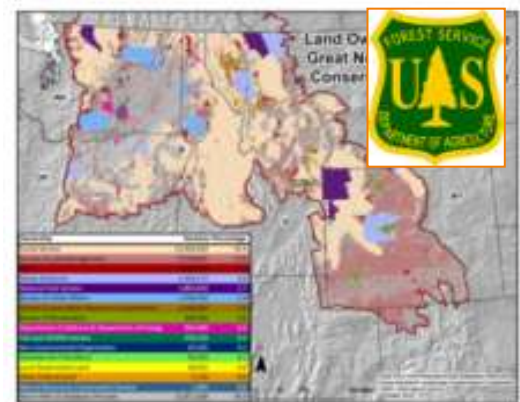
## Greater Sage Grouse

- Geospatial information
- Landscape analysis
- Species data
- Ecological model
- Model validation
- Decision support
- Application to mgmt
- Evaluate and revise





# Demonstration Collaboration Project: ID-MT&WY WGA DSS, BLM REA, USFS IRPS, HotR Initiative



- Crucial Habitats and Corridors ~13 species
- Vulnerability Assessments for climate change, invasives, and land use change

# GNLCC Sponsored Geo-Portal

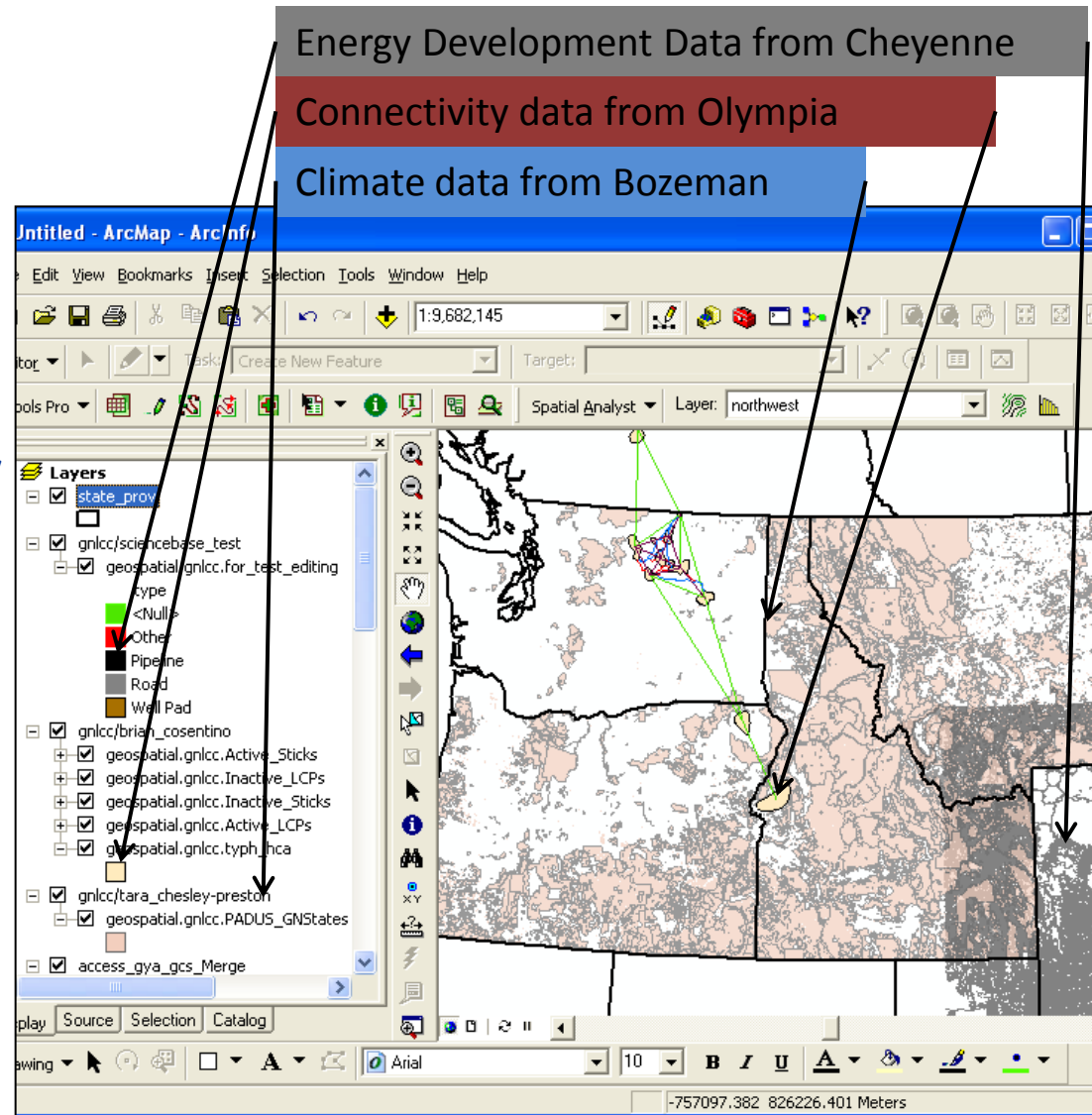
## 1 Delivery of DS climate data

## 2 Develops and delivers:

- Web-based collaboration tool
- Leveraged dollars and inter-agency know-how
- Innovative analytical environment

## 3 Collaborative modeling

- Leveraged funds
- Consistent data facilitates compatible models









# FY11 Priorities

- Strategic Framework
- Partner (Eco) Forums
- FY11 Funding Guidance
- Capacity Grant Program
- Collaboration (Demo) Project
  - 2 WGA Pilots
  - BLM Middle Rockies REA
  - USFS IRPS and watershed vulnerability

